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L3: Entry 1 of 1 File: DWPI May 2, 2003

DERWENT-ACC-NO: 2000-424455
DERWENT-WEEK: 200330

TITLE: Darkening of a zinc-containing surface of a zinc, zinc alloy or zinc-coated workpiece is carried out by dipping or anodizing in an aqueous ammonium or sodium nitrite solution

INVENTOR: KRUSE, T; MEISTERJAHN, P

PATENT-ASSIGNEE:

ASSIGNEE	CODE
DOERKEN AG EWALD	DORN

PRIORITY-DATA: 1998DE-1058795 (December 18, 1998)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
EP 1141449 B1	May 2, 2003	G	000	C25D011/34
DE 19858795 A1	June 21, 2000		005	C25D011/34
WO 200037717 A2	June 29, 2000	G	000	C25D011/00
DE 19858795 C2	March 15, 2001		000	C25D011/34
EP 1141449 A2	October 10, 2001	G	000	C25D011/34
JP 2002533573 W	October 8, 2002		037	C25D011/34

DESIGNATED-STATES: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE JP US AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

APPLICATION-DATA:

PUB-NO	APPL-DATE	APPL-NO	DESCRIPTOR
EP 1141449B1	December 17, 1999	1999EP-0963569	
EP 1141449B1	December 17, 1999	1999WO-EP10036	
EP 1141449B1		WO 200037717	Based on
DE 19858795A1	December 18, 1998	1998DE-1058795	
WO 200037717A2	December 17, 1999	1999WO-EP10036	
DE 19858795C2	December 18, 1998	1998DE-1058795	
EP 1141449A2	December 17, 1999	1999EP-0963569	
EP 1141449A2	December 17, 1999	1999WO-EP10036	
EP 1141449A2		WO 200037717	Based on
JP2002533573W	December 17, 1999	1999WO-EP10036	
JP2002533573W	December 17, 1999	2000JP-0589764	
JP2002533573W		WO 200037717	Based on

INT-CL (IPC): C23 C 22/62; C25 D 11/00; C25 D 11/34

ABSTRACTED-PUB-NO: DE 19858795A
BASIC-ABSTRACT:

NOVELTY - Darkening of a zinc surface involves dipping or anodizing in an aqueous ammonium or sodium nitrite solution.

DETAILED DESCRIPTION - Zinc-containing workpiece surface layer is darkened by dip anodizing in an aqueous solution having a pH of 9-14 and containing 40-50 g/l NH_4NO_3 or $NaNO_3$ at 15-45 deg. C and 0.01-0.1 A/cm2 current density.

INDEPENDENT CLAIMS are also included for the following:

(i) a workpiece with a zinc-containing surface layer produced by the above process;

(ii) an anodizing electrolyte comprising an aqueous solution of pH 9-14 and 40-50 g/l NH_4NO_3 or $NaNO_3$ concentration;

(iii) darkening of a zinc-containing workpiece surface layer by dipping (at 0.01-0.1 A/cm2 current density) in an aqueous solution having a pH of 9-14 and containing 40-50 g/l NH_4NO_3 or $NaNO_3$ at 15-45 deg. C; and

(iv) pretreatment of a zinc-containing workpiece surface layer by applying an alternating voltage to the electrodes of an anodizing bath and immersing the workpiece in the bath while maintaining the alternating voltage.

USE - For surface darkening of a zinc, zinc alloy or zinc-coated workpiece, e.g. galvanized steel sheet.

ADVANTAGE - The process produces a homogeneous black surface layer having high adhesion, uniformity, corrosion resistance and absorption capacity for, e.g., visible light or IR radiation, avoids the use of toxic hexavalent chromium and is compatible with conventional aluminum anodizing technology.

CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS: DARK ZINC CONTAIN SURFACE ZINC ZINC ALLOY ZINC COATING WORKPIECE CARRY DIP ANODISE AQUEOUS AMMONIUM SODIUM NITRITE SOLUTION

DERWENT-CLASS: M11

CPI-CODES: M11-E;

UNLINKED-DERWENT-REGISTRY-NUMBERS: 1697U

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: C2000-128756

RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(chem. oxidn. in alk. nitrite-**nitrate** melt)

IT **1310-73-2**, Sodium **hydroxide**, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(chem. oxidn. of iron-nickel alloy in alk. nitrite-**nitrate** melt contg.)

IT 7439-92-1, Lead, processes 7440-32-6, Titanium, processes 7440-43-9, Cadmium, processes **7440-66-6**, **Zinc**, processes 151594-99-9
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); PROC (Process)
(electrooxidn. in alk. soln.)

IT 7440-50-8, Copper, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(electrooxidn. in carbonate **electrolyte**)

IT 298-14-6, Monopotassium carbonate 584-08-7, Potassium carbonate
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(electrooxidn. in carbonate **electrolyte** contg.)

IT 7440-22-4, Silver, uses
RL: DEV (Device component use); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)
(electrooxidn. in phosphate **electrolyte**)

IT 20667-12-3P, Silver oxide
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PREP (Preparation); PROC (Process)
(formation by silver electrooxidn. in phosphate **electrolyte**)

IT 7758-11-4, Dipotassium phosphate 7783-28-0, Diammonium phosphate
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(silver electrooxidn. in phosphate **electrolyte** contg.)

IT **7631-99-4**, Sodium **nitrate**, reactions **7632-00-0**, Sodium nitrite
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)
(chem. oxidn. in alk. nitrite-**nitrate** melt)

IT **1310-73-2**, Sodium **hydroxide**, uses
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)
(chem. oxidn. of iron-nickel alloy in alk. nitrite-**nitrate** melt contg.)

IT **7440-66-6**, **Zinc**, processes
RL: MSC (Miscellaneous); PEP (Physical, engineering or chemical process); PROC (Process)
(electrooxidn. in alk. soln.)

L67 ANSWER 3 OF 3 HCA COPYRIGHT 2003 ACS
133:50150 Procedure for darkening of a layer on material containing **zinc**. Kruse, Thomas; Meisterjahn, Peter (Ewald Doerken A.-G., Germany). Ger. Offen. DE 19858795 A1 **20000621**, 6 pp. (German). CODEN: GWXXBX. APPLICATION: DE 1998-19858795 19981218.

AB The invention refers to a procedure for darkening a layer on a piece of material contg. **zinc**. A method is based on the material oxidn. by immersion in an aq. soln. contg. **hydroxide** and a

nitrate contains and by the anodic oxidn. in an aq. soln. with a pH value of 9 to 14 contg. **NH4NO3** and/or **NaNO3** in concn. of 40 to 50 g/l at temp. of 15 to 45.degree. and using c.d. of 0,01 to 0.1 A/cm2. The suitable electrolytes and the pretreatment procedure are needed before the oxidn. of the piece of material.

IC ICM C25D011-34
CC 72-7 (Electrochemistry)
ST darkening layer **zinc alloy** electrochem oxidn anodization
IT **Anodization**
Oxidation
Oxidation, electrochemical
(procedure for darkening of a layer on material from **zinc alloy** or **zinc**-coated and **bath** for **darkening**)
IT **Zinc alloy**, base
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(procedure for darkening of a layer on material from **zinc alloy** or **zinc**-coated and **bath** for **darkening**)
IT 64-19-7, Acetic acid, uses **1310-73-2**, Sodium **hydroxide**, uses **7631-99-4**, Sodium **nitrate**, uses **7632-00-0**, Sodium nitrite
RL: NUU (Other use, unclassified); USES (Uses)
(electrolyte; procedure for darkening of a layer on material from **zinc alloy** or **zinc**-coated and **bath** for **darkening**)
IT **7440-66-6**, **Zinc**, properties **276250-54-5**, Iron 0.5-1.5, **zinc** 98-100
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(procedure for darkening of a layer on material from **zinc alloy** or **zinc**-coated and **bath** for **darkening**)
IT 7440-32-6, Titanium, uses
RL: NUU (Other use, unclassified); USES (Uses)
(ref. electrode; procedure for darkening of a layer on material from **zinc alloy** or **zinc**-coated and **bath** for **darkening**)
IT 12597-69-2, Steel, uses
RL: NUU (Other use, unclassified); USES (Uses)
(substrate; procedure for darkening of a layer on material from **zinc alloy** or **zinc**-coated and **bath** for **darkening**)
IT **1310-73-2**, Sodium **hydroxide**, uses **7631-99-4**, Sodium **nitrate**, uses **7632-00-0**, Sodium nitrite
RL: NUU (Other use, unclassified); USES (Uses)
(electrolyte; procedure for darkening of a layer on material from **zinc alloy** or **zinc**-coated and **bath** for **darkening**)
IT **7440-66-6**, **Zinc**, properties **276250-54-5**, Iron 0.5-1.5, **zinc** 98-100
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)
(procedure for darkening of a layer on material from **zinc alloy** or **zinc**-coated and **bath** for **darkening**)

DERWENT-ACC-NO: 2000-424455

DERWENT-WEEK: 200345

TITLE: Darkening of a zinc-containing surface of a zinc, zinc alloy or zinc-coated workpiece is carried out by dipping or anodizing in an aqueous ammonium or sodium nitrite solution

INVENTOR: KRUSE, T; MEISTERJAHN, P

PATENT-ASSIGNEE: DOERKEN AG EWALD[DORN]

PRIORITY-DATA: 1998DE-1058795 (December 18, 1998)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES	MAIN-IPC
DE 59905366 G	June 5, 2003	N/A	000	C25D 011/34
DE 19858795 A1	June 21, 2000	N/A	005	C25D 011/34
WO 200037717 A2	June 29, 2000	G	000	C25D 011/00
DE 19858795 C2	March 15, 2001	N/A	000	C25D 011/34
EP 1141449 A2	October 10, 2001	G	000	C25D 011/34
JP 2002533573 W	October 8, 2002	N/A	037	C25D 011/34
EP 1141449 B1	May 2, 2003	G	000	C25D 011/34

DESIGNATED-STATES: JP US AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE AT BE CH CY DE DK ES
FI FR GB GR IE IT LI LU MC NL PT SE

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
DE 59905366G	N/A	1999DE-0505366	December 17, 1999

DE 59905366G December 17, 1999	N/A	1999EP-0963569
DE 59905366G December 17, 1999	N/A	1999WO-EP10036
DE 59905366G N/A	Based on	EP 1141449
DE 59905366G N/A	Based on	WO 200037717
DE 19858795A1 December 18, 1998	N/A	1998DE-1058795
WO 200037717A2 December 17, 1999	N/A	1999WO-EP10036
DE 19858795C2 December 18, 1998	N/A	1998DE-1058795
EP 1141449A2 December 17, 1999	N/A	1999EP-0963569
EP 1141449A2 December 17, 1999	N/A	1999WO-EP10036
EP 1141449A2 N/A	Based on	WO 200037717
JP2002533573W December 17, 1999	N/A	1999WO-EP10036
JP2002533573W December 17, 1999	N/A	2000JP-0589764
JP2002533573W N/A	Based on	WO 200037717
EP 1141449B1 December 17, 1999	N/A	1999EP-0963569
EP 1141449B1 December 17, 1999	N/A	1999WO-EP10036
EP 1141449B1 N/A	Based on	WO 200037717

INT-CL (IPC): C23C022/62, C25D011/00 , C25D011/34

ABSTRACTED-PUB-NO: DE 19858795A

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CHOSEN-DRAWING: Dwg.0/0

TITLE-TERMS: DARK ZINC CONTAIN SURFACE ZINC ZINC ALLOY ZINC COATING WORKPIECE CARRY DIP ANODISE AQUEOUS AMMONIUM SODIUM NITRITE SOLUTION

DERWENT-CLASS: M11

CPI-CODES: M11-E;

UNLINKED-DERWENT-REGISTRY-NUMBERS: 1697U

SECONDARY-ACC-NO:
CPI Secondary Accession Numbers: C2000-128756